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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,537	06/04/2001	Carl J. Radens	FIS920000011US2(13312A)	4948
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INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533			EXAMINER LEWIS, MONICA	
			ART UNIT 2822	PAPER NUMBER

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/873,537

Applicant(s)

RADENS ET AL.

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment filed February 6, 2004.

Response to Arguments

2. Applicant's arguments with respect to claims 22-30 have been considered but are moot in view of the new ground(s) of rejection.

Priority

3. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 22, 23, 26, 27, 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Dixit et al. (U.S. Patent No. 5,233,217).

In regards to claim 22, Dixit et al. ("Dixit") discloses the following:

a) a substrate (10) having a first level of electrically conductive features (For Example: See Figure 1G);

b) a patterned anti-fuse dielectric layer (11) formed on said substrate, wherein said patterned anti-fuse dielectric layer includes an opening to at least one of said first level of electrically conductive features (For Example: See Figure 1G);

c) a patterned interlevel dielectric material (15) formed on said patterned anti-fuse dielectric layer (For Example: See Figure 1G);

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d) vias, at least one of said vias has a via space formed above said opening and at least one other of said vias exposes a portion of said anti-fuse layer to define an antifuse location (For Example: See Figure 1G); and

e) a second level of electrically conductive features (16) formed in said vias and via spaces where the electrically conductive feature of said second level at said at least one of said vias forms an electrical interconnect between said first and second levels of electrically conductive features and where the electrically conductive feature of said second level at said at least one other of said vias defines an antifuse between said first and second levels with said exposed portion (For Example: See Figure 1G).

In regards to claim 23, Dixit discloses the following:

a) substrate is composed of an interlevel dielectric material that is the same or different from said patterned interlevel dielectric material (For Example: See Column 2 Lines 62-68 and Column 2 Line 1).

In regards to claim 26, Dixit discloses the following:

a) first and second levels of electrically conductive features are composed of the same or different conductive metal selected from the group consisting of aluminum, tungsten, copper, chromium, gold, platinum, palladium and alloys, mixtures and complexes thereof (For Example: See Column 2 Lines 10-45).

In regards to claim 27, Dixit discloses the following:

a) anti-fuse dielectric layer is a dielectric material selected from the group consisting of SiO_2 , Si_3N_4 , Si oxynitrides, amorphous Si, amorphous C, H-containing dielectrics, carbon, germanium, selenium, compound semiconductors, ceramics and anti-reflective coatings (For Example: See Column 2 Line 1).

In regards to claim 29, Dixit discloses the following:

a) an interconnect level is formed over said patterned interlevel dielectric layer (For Example: See Figure 1G).

In regards to claim 30, Dixit discloses the following:

a) interconnect level includes a tapered metal contact region (For Example: See Figure 1G).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 24 is rejected under 35 U.S.C. 103(a) as obvious over Dixit et al. (U.S. Patent No. 5,233,217) in view of Chang et al. (U.S. Patent No. 5,807,786).

In regards to claim 24, Dixit fails to disclose the following:

a) interlevel dielectric material is composed of an inorganic semiconductor material selected from the group consisting of SiO₂, Si₃N₄, diamond, diamond-like carbon and fluorinated doped oxides.

However, Chang discloses a semiconductor device where the anti-fuse layer can comprise a dielectric material, such as silicon nitride, or an amorphous silicon layer (For Example: See Column 1 Lines 29-61). Hence, these materials are art-recognized equivalents. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made that a silicon oxide or silicon nitride layer could have been substituted for the amorphous silicon layer of Dixit.

Additionally, since Dixit and Chang are both from the same field of endeavor, the purpose disclosed by Chang would have been recognized in the pertinent art of Dixit.

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8. Claim 25 is rejected under 35 U.S.C. 103(a) as obvious over Dixit et al. (U.S. Patent No. 5,233,217) in view of Go et al. (U.S. Patent No. 5,592,016).

In regards to claim 25, Huang fails to disclose the following:

a) interlevel dielectric material is composed of an organic dielectric material selected from the group consisting of polyimides, polyamides, paralyene and polymethylmethacrylate.

However, Go et al. ("Go") discloses a semiconductor device where the dielectric material is composed of polyimide (For Example: See Column 4 Lines 39-48). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Dixit to include a dielectric material composed of polyimide as disclosed in Go because it can be utilized in high temperature processes (For Example: See Abstract).

Additionally, since Dixit and Go are both from the same field of endeavor, the purpose disclosed by Go would have been recognized in the pertinent art of Dixit.

9. Claim 28 is rejected under 35 U.S.C. 103(a) as obvious over Dixit et al. (U.S. Patent No. 5,233,217) in view of Shroff et al. (U.S. Patent No. 6,515,343).

In regards to claim 28, Dixit fails to disclose the following:

a) anti-reflective coating is silicon oxynitride.

However, Shroff et al. ("Shroff") discloses silicon oxynitride (For Example: See Column 2 Lines 36-43). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Dixit to include silicon oxynitride as disclosed in Shroff because it aids in preventing the diffusion of impurities (For Example: See Column 2 Lines 36-43).

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Additionally, since Dixit and Shroff are both from the same field of endeavor, the purpose disclosed by Shroff would have been recognized in the pertinent art of Dixit.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

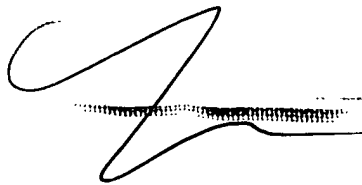
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final

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communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

May 3, 2004



Mary Wilczewski
Primary Examiner